



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,777	02/21/2006	Jurgen Frank	13156-00037-US	9551
23416 7590 03/26/2008 CONNOLLY BOVE LODGE & HUTZ, LLP P O BOX 2207 WILMINGTON, DE 19899				
EXAMINER				
REDDY, KARUNA P				
ART UNIT		PAPER NUMBER		
1796				
MAIL DATE		DELIVERY MODE		
03/26/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/568,777

**Applicant(s)**

FRANK ET AL.

**Examiner**

KARUNA P. REDDY

**Art Unit**

1796

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10, 14, 16-18 and 20-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 14, 16-18 and 20-24 is/are rejected.
- 7) ☒ Claim(s) 6-10, 14, 17 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/19/2008 has been entered.

Applicant's amended claims 1, 4, 16 and 20-21; and cancelled claims 11-13, 15 and 19. Claims 1-10, 14, 16-18 and 20-24 are currently pending in the application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Objections***

3. Claims 6-10, 14, 17-18 are objected to because of the following informality: In claim 6, the use of phrase "preparable by" renders unclear whether other polymers made using other specified processes are also within the claimed scope. If applicant is intending to specify a polymer which is produced by the

recited process, then the phrase "prepared by" should be used. Appropriate correction is required.

Claims 7-10, 14 and 17-18 are dependent on claim 6 and are subsumed by this objection.

***Claim Rejections - 35 USC § 102/103***

4. Claims 6, 8 and 17-18 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chaudary (EP 019 662 A2).

Chaudary discloses a water-in-oil emulsion of a water soluble polymer. The water soluble polymer reads on claim 6 and is preferably dissolved in water phase of the emulsion. The water-in-oil emulsion may be the direct product of an inverse emulsion polymerization process (abstract). Such inversion emulsions are preferably prepared by direct emulsion polymerization starting from a solution of water soluble monomer(s). The water soluble monomer(s) are first dissolved in water and this aqueous phase is emulsified in a hydrocarbon or other hydrophobic medium as the continuous phase to form a water-in-oil emulsion of the monomer(s). The water soluble monomer(s) are then polymerized within the dispersed aqueous phase (page 2, lines 6-15). The water soluble polymers may be non-ionic, anionic or cationic and may be lightly crosslinked by the incorporation of di- or poly-functional monomers (page 2, lines 19-22).

Polymerization can be effected using known redox initiators (page 3, lines 11-13). The method of polymerization was carried out by firstly preparing an aqueous phase containing water soluble monomers. The oil phase contains Witcamide 511, which acts as a water-in-oil emulsifier (page 4, lines 21-38) of claims 4, 8 and 20-21. The aqueous phase was then emulsified in the oil phase to give a stable emulsion. Polymerization was then carried out using a redox catalyst (page 5, lines 1-5). It is sometimes advantageous to include an oil-in-water emulsifier or a mixture of oil-in-water emulsifier (lines 17-20). Chaudary provides a method for thickening a liquid medium which is at least mainly non-aqueous with a thickener comprising a water-in-oil emulsion of a water soluble polymer, which water soluble polymer is present in the water phase of the water-in-oil emulsion (page 1, lines 22-26). Non-aqueous media which can be thickened by the inverse emulsions include polar media which are used in printing inks (page 3, lines 24-27).

Chaudary differs with respect to redox initiator pair used to prepare the polymer and properties of the water soluble polymer.

However, Claim 6 is written in a product-by-process form and claims 8 and 17-18 are dependent on claim 6. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the

prior product was made by a different process." See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) and *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983).

***Claim Rejections - 35 USC § 103***

5. Claims 1-5, 7, 9-10, 14, 16, and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chaudary (EP 019 662 A2) in view of Berghofer et al (US 6, 211, 400 B1).

The discussion with respect to Chaudary in paragraph 4 above is incorporated here by reference. Furthermore, the water soluble polymers may be non-ionic, anionic or cationic (page 2, lines 19-20). Suitable non-ionic monomers include acrylamide (page 2, lines 24-25). Suitable anionic monomers include (meth)acrylic acid and their alkali metal and ammonium salts (page 2, lines 27-30). In example 1, the method of polymerization was carried out by firstly preparing an aqueous phase containing water soluble monomers. There is no mention of addition of a transition metal during inverse emulsion polymerization.

Chaudary differs with respect to

- a) the redox initiator pair,

Art Unit: 1796

- b) addition of redox initiator and oil-in-water emulsifier to water-in-oil emulsion instead of aqueous monomer solution of claims 4 and 20-21,

and silent with respect to

- c) residual monomer content, speck content, gel body content and induction times during polymerization,
- d) solid composition of claim 10.

With respect to a), Berghofer et al teach that in emulsion polymerization systems, peroxide compounds, such as hydrogen peroxide or peroxydisulfate, are used as free radical formers. In order to increase the rate of free-radical formation, reducing agents are again used. Since the formaldehyde-free reducing agents, such as bisulfites, are weaker reducing agents, the disadvantage of less complete polymerization compared with formaldehyde sulfoxylates must be accepted (column 2, lines 1-5). Berghofer et al also teach that sulfinic acid is one of the strongest known reducing agents (column 1, lines 5-6). They are preferably used as a cocatalyst in emulsion polymerization together with peroxidic initiators in order to allow the polymerization to be carried out at low temperatures. See example 3, wherein the sulfinic acid is 2-hydroxy-2-sulfinatoacetic acid, disodium salt. See example 11, wherein an aqueous solution consisting of 270 g of water and 33 g of reducing agent according to claim 3 is used in emulsion polymerization. Therefore, it would have been obvious to use 2-hydroxy-2-sulfinatoacetic acid, disodium salt as a reducing

agent and hydrogen peroxide or peroxodisulfate as an oxidizing agent of the redox initiator pair, for the above mentioned advantages.

With respect to b), the order of addition of ingredients is merely a matter of choice and is within the skill of the art to adopt such procedure as is found most satisfactory. One would not expect that minor variation in the sequence of contacting reagents would impart substantially different effect specially in light of the specification (paragraph 0066) of instant invention wherein the (co)polymerization is affected after the aqueous phase is emulsified. See *In re Hempel*, 74 USPQ 171-173 (CCPA 1947). See also *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is *prima facie* obvious.)

With respect to c), residual monomer content of at most 5% by weight, speck content of at most 0.5%, gel body content of at most 0.5% are intrinsically present in the water soluble polymer prepared by process of Chaudary utilizing redox initiator pair of Berghofer et al, and avoiding induction time during polymerization process naturally flows from the combination of inversion emulsion polymerization process of Chaudary and the redox initiator pair of Berghofer et al. Since PTO cannot conduct experiments, the burden of proof is shifted to the applicants to establish an unobviousness difference. See *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980).

With respect to d), in light of the specification of instant invention (paragraph 0083) that methods for removing inert hydrophobic liquid and water



after copolymerization are within the scope of a skilled artisan, it would have been obvious to one skilled in the art to remove hydrophobic liquid i.e. oil and water from water-in-oil emulsion and obtain the solid composition comprising oil-in-water emulsifier, water-in-emulsifier and at least one homopolymer or copolymer.

6. Claims 1-5, 7, 9-10, 14, 16, and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chaudary et al (EP 0 196 162 A2) in view of Brown et al (US 2002/0068791 A1).

The discussion with respect to Chaudary in paragraph 4 above is incorporated here by reference. Furthermore, the water soluble polymers may be non-ionic, anionic or cationic (page 2, lines 19-20). Suitable non-ionic monomers include acrylamide (page 2, lines 24-25). Suitable anionic monomers include (meth)acrylic acid and their alkali metal and ammonium salts (page 2, lines 27-30). In example 1, the method of polymerization was carried out by firstly preparing an aqueous phase containing water soluble monomers. There is no mention of addition of a transition metal during inverse emulsion polymerization.

Chaudary differs with respect to

- a) the redox initiator pair and residual monomer content.

Art Unit: 1796

- b) addition of redox initiator and oil-in-water emulsifier to water-in-oil emulsion instead of aqueous monomer solution of claims 4 and 20-21.

and silent with respect to

- c) speck content, gel body content and induction times during polymerization,
- d) solid composition of claim 10.

With respect to a), Brown et al teach a process for preparing an aqueous emulsion polymer including providing at least one ethylenically unsaturated monomer and a free radical redox initiator system under emulsion polymerization conditions, the redox initiator system including an water-soluble oxidizing agent and a sulfinic acid or salts as reducing agent (abstract). Furthermore, it has been surprisingly found that lowered residual monomers are found in emulsion polymerization of ethylenically unsaturated monomers when certain free radical redox initiator systems are used, the redox initiator system including an oxidizing agent and a sulfinic acid or salts, thereof as reducing agent. An improvement is found in reducing residual monomer at the end of a emulsion polymerization as well as in an emulsion polymerization itself (paragraph 0005). The oxidizing agent includes a water-soluble oxidizing agent such as hydrogen peroxide and alkali metal persulfates (paragraph 0011). A preferred reducing agent is 2-hydroxy-2-sulfinatoacetic acid (paragraph 0011). The residual monomer content is typically less than 5% by weight based on polymer weight (paragraph 0025).

Therefore, it would have been obvious to use the redox initiator system of Brown et al, preferably containing 2-hydroxy-2-sulfonatoacetic acid as a reducing agent and hydrogen peroxide or alkali metal persulfate as oxidizing agent, in the inverse emulsion polymerization of Chaudary et al to lower the residual monomer content to less than 5% during as well as after the emulsion polymerization.

With respect to b), the order of addition of ingredients is merely a matter of choice and is within the skill of the art to adopt such procedure as is found most satisfactory. One would not expect that minor variation in the sequence of contacting reagents would impart substantially different effect specially in light of the specification (paragraph 0066) of instant invention wherein the (co)polymerization is affected after the aqueous phase is emulsified. See *In re Hempel*, 74 USPQ 171-173 (CCPA 1947). See also *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is *prima facie* obvious.)

With respect to c), speck content of at most 0.5%, gel body content of at most 0.5% are intrinsically present in the water soluble polymer prepared by process of inverse emulsion polymerization of Chaudary utilizing redox initiator pair of Brown et al, and avoiding induction time during polymerization process naturally flows from the combination of inversion emulsion polymerization process of Chaudary and the redox initiator pair of Brown et al. Since PTO cannot conduct experiments, the burden of proof is shifted to the applicants to

establish an unobviousness difference. See *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980).

With respect to d), in light of the specification of instant invention (paragraph 0083) that methods for removing inert hydrophobic liquid and water after copolymerization are within the scope of a skilled artisan, it would have been obvious to one skilled in the art to remove hydrophobic liquid i.e. oil and water from water-in-oil emulsion and obtain the solid composition comprising oil-in-water emulsifier, water-in-emulsifier and at least one homopolymer or copolymer.

### ***Response to Arguments***

7. Applicant's arguments filed 6/1/2007 have been fully considered but they are not persuasive. Specifically, applicant argues that (A) Berghofer describes the use of 2-hydroxy-2-sulfinatoacetic acid in emulsion polymerization reactions i.e. reaction is conducted in an oil-in-water emulsion indicating that the initiator is insoluble in water and it would seem impossible to bring 2-hydroxy-2-sulfinatoacetic acid into the micelles of water-in-oil emulsion, in order to start the polymerization reaction of present claims; (B) None of the cited references describe any of the technical problems resolved by the present invention i.e. short induction times and low amounts of specks and gel bodies; (C) product obtained, in comparative runs, from polymerization using the redox initiator of

Chaudary i.e. ammonium persulphate and sodium metabisulphite, coagulated during or at the end of the reaction and significant amounts of swelling particles were formed.

With respect to (A), examiner points applicant to example 11 of Berghofer et al wherein emulsion polymerization was conducted using an aqueous solution of the reducing agent according to example 3 i.e. 2-hydroxy-2-sulfonatoacetic acid, disodium salt is soluble in aqueous medium and can therefore be brought into micelles of water-in-oil emulsion and used in the inversion emulsion polymerization of Chaudary.

With respect to (B), resolution of technical problems identified in present invention naturally flows from the combination of inversion emulsion process of Chaudary and the redox initiator pair of Berghofer et al.

With respect to (C), there is no comparative data, as alleged by the applicant, in present invention using the redox initiator pair of Chaudary. Even if it was there, teachings of Berghofer et al provide the motivation to replace redox initiator of Chaudary with the redox initiator pair consisting of 2-hydroxy-2-sulfonatoacetic acid, disodium salt as the reducing agent and hydrogen peroxide or sodium peroxodisulfate as the oxidizing agent.

8. Applicant's arguments filed 2/19/2008 have been fully considered but they are not persuasive. Specifically, applicant argues that (A) Chaudary does not describe or provide any guidance on the effect, positive or negative, for including

every such initiator in every form of polymerization including inverse polymerization; (B) Brown et al describes normal emulsion polymerization i.e. oil phase is emulsified in water, whereas in the present invention water is emulsified in oil; and (C), Brown et al includes the use of a water insoluble oxidizing agent in a redox initiator system, which is not included in the claimed redox initiator pair,

With respect to (A) and (B), Chaudary is open to any kind of redox initiator which may be oil or water soluble i.e. an initiator that can be brought into micelles of water-in-oil or oil-in-water emulsions during polymerization. Chaudary is used in the office action for its disclosure of the inversion emulsion polymerization. Brown et al is used for its teaching that residual monomer content is lowered when polymerization is conducted in the presence of redox initiator system comprising 2-hydroxy-2-sulfonatoacetic acid, disodium salt as the reducing agent and hydrogen peroxide or sodium peroxodisulfate as the oxidizing agent.

With respect to (C), present claims recite polymerization in the presence of redox initiator pair, wherein sodium peroxodisulfate or hydrogen peroxide as an oxidizing agent and 2-hydroxy-2-sulfonatoacetic acid, disodium salt as a reducing agent are the redox initiator pair. Support for the amendment is found in abstract with the recitation of at least one redox initiator pair "comprising" an oxidizing agent and a reducing agent. While the claim is amended to include a specific oxidizing agent and a reducing agent, the term "comprising" renders it open ended allowing for other components such as the water-insoluble oxidizing agent of Brown et al.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARUNA P. REDDY whose telephone number is (571)272-6566.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit: 1796

/VASUDEVAN S. JAGANNATHAN/

Supervisory Patent Examiner, Art Unit 1796